Expanding the Value of Parts Management Solutions through Reference Content

Grant Hunter

PSMC Working Group Meeting

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Topics/Agenda

- IHS Overview
- Business Challenges – ‘Parts Management’
- Adding the Value of Parts Reference Content
- Framework for Integrating Reference Content
- Case Studies
- Q&A, General Discussion

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Information Handling Services – Structure

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- Finance
- Legal
- Human Resources
- Information Technology

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- Independent operating entity with separate:
  - Sales
  - Marketing
  - Operations
  - Data Management
  - Customer Service

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- Independent operating entity with separate:
  - Sales
  - Marketing
  - Operations
  - Data Management
  - Customer Service

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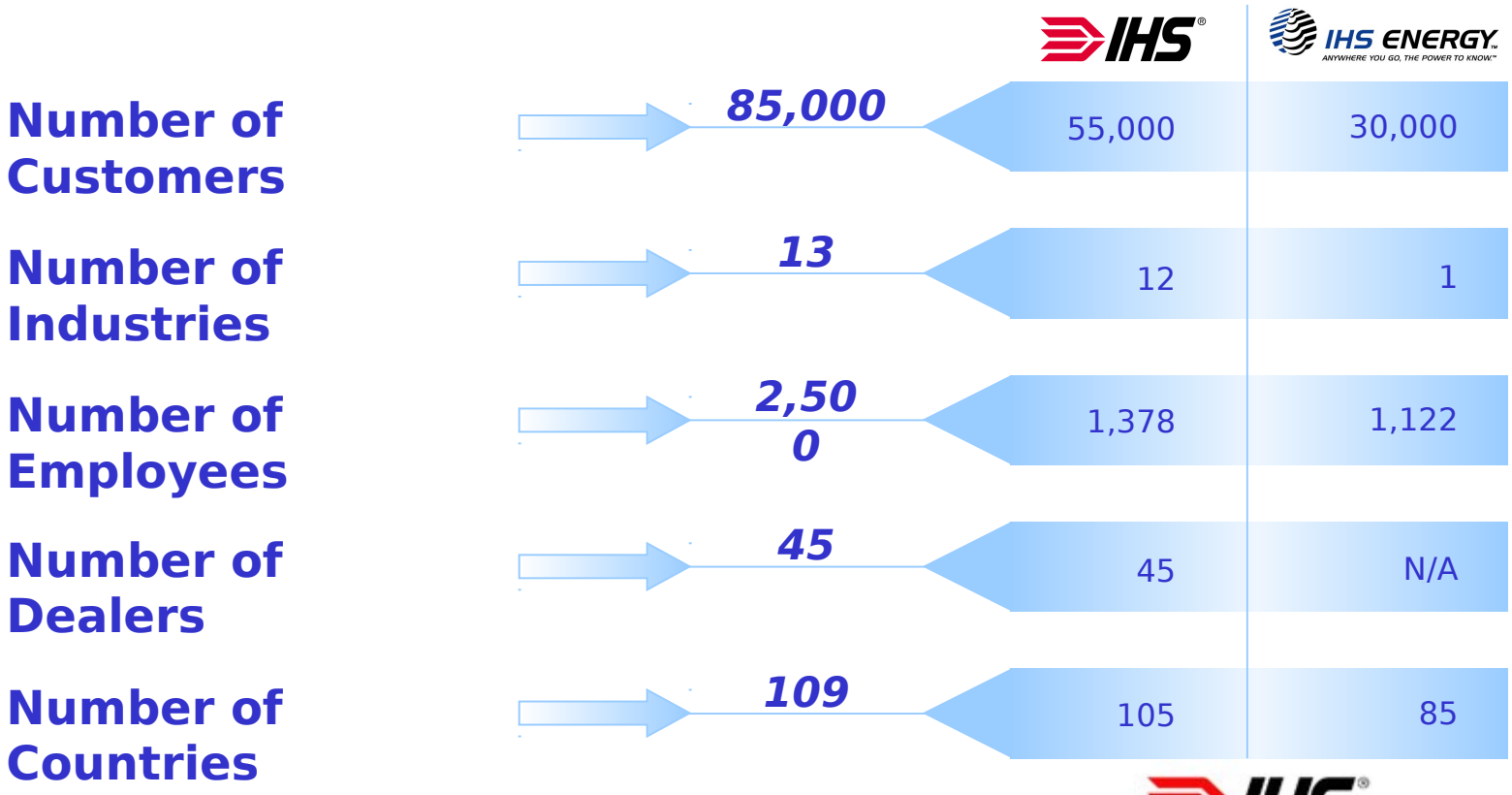
IHS Group – Summary & Statistics

- 40+ years as a worldwide leader in information management
- $425 million in revenue, profitable & debt free



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IHS Major Industries & Sample Customers

Government
- Navy, Army, Air Force
- DLA
- Federal Agencies
- State and Local Governments

Aviation/Automotive
- Boeing
- United Technologies
- General Motors
- BAE

Electronic/Electrical
- Intel Corporation
- Lucent Technologies
- Harris Corporation

Engineering Services
- Bechtel
- Stone & Webster
- Kellogg, Brown & Root
- Black & Veatch

Energy
- ExxonMobil
- ChevronTexaco
- Shell
- DuPont

Utilities
- American Electric Power
- Tennessee Valley Authority
- Arizona Public Service
- Florida Power & Light

Academic
- Libraries
- Universities

Construction
- Residential
- Industrial

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Business Challenges – Parts Management

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What are the Problems?

	PROBLEM	ROOT CAUSE
Lower Revenue	• Lower design engineering productivity	*Inefficient part search & analysis tools*
	• Unplanned design iterations delay new products	*Engineering specifying EOL / unavailable parts*
	• Can't ramp production - Can't get parts	*Part list errors - bought the wrong parts*
Higher Costs	• Mfg downtime - Part shortages	*Unplanned EOL or allocation, false stock-outs*
	• Can't identify parts / can't find parts	*Mfr part number & part descriptions errors*
	• Part duplication - Can't get volume pricing	*No part re-use - no tools for re-use analysis*
		Supply chain partner AVLs not aligned
	• Not leveraging supplier relationships	*No visibility to supply - obsolescence, allocation*
	• Costly expedites and spot market buys	*Engineering specifying non-standard parts*
Higher Inventory	• Expected cost reductions do not occur	*Using non-preferred, non-qualified suppliers*
	• Quality problems - high field failures	*Inconsistent part descriptions*
	• High excess & obsolete inventory	*Lack of timely EOL information*
	• Excessive (panic) last-time-buys (LTB)	*Engineering specifying long lead-time parts*
	• Can't respond to changes in demand	

These problems impact core business processes

	Product Design	Supply Chain Procurement	Manufacturing Sustaining & MRO	Sales Marketing
Key Success Metrics	• Engineering Productivity • R&D Costs • Time to Market • Product Quality • Design for Supply Chain	• Spend Aggregation • Supplier & Material Rationalization • Procurement Expense	• Raw Materials Inventory • Throughput • Equipment Uptime • Parts / Spares Inventory	• Revenue • Selling Expense • Customer Retention • Competitive Advantage • Market Share
Core Business Process				
Factors Preventing Success	• Poor search tools - Can't find parts • Lack of technical detail • Lack of standardization • Can't find alternates • No lifecycle status info	• Can't manage to AMLs/AVLs • Maverick buys • Supplier proliferation • Parts proliferation & duplication • Disparate parts & supplier databases • Ineffective Supply	• Lack of visibility to inventories • Can't locate parts & spares • Maverick buys • Can't manage to AMLs/AVLs • Disparate data sources	• Lack of standardized product information • Can't see product inventory • Can't compare products • Lack of competitive differentiation

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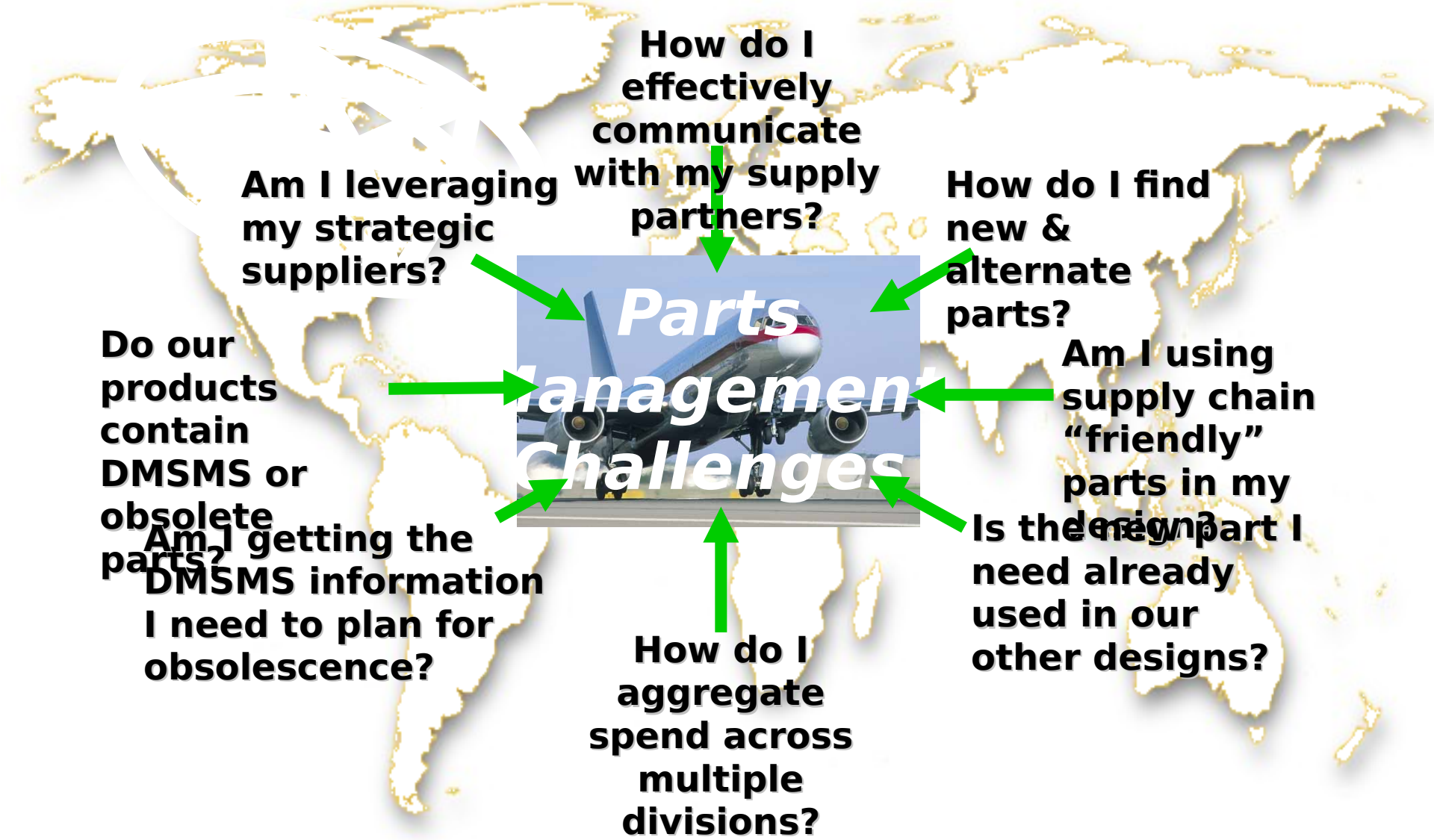
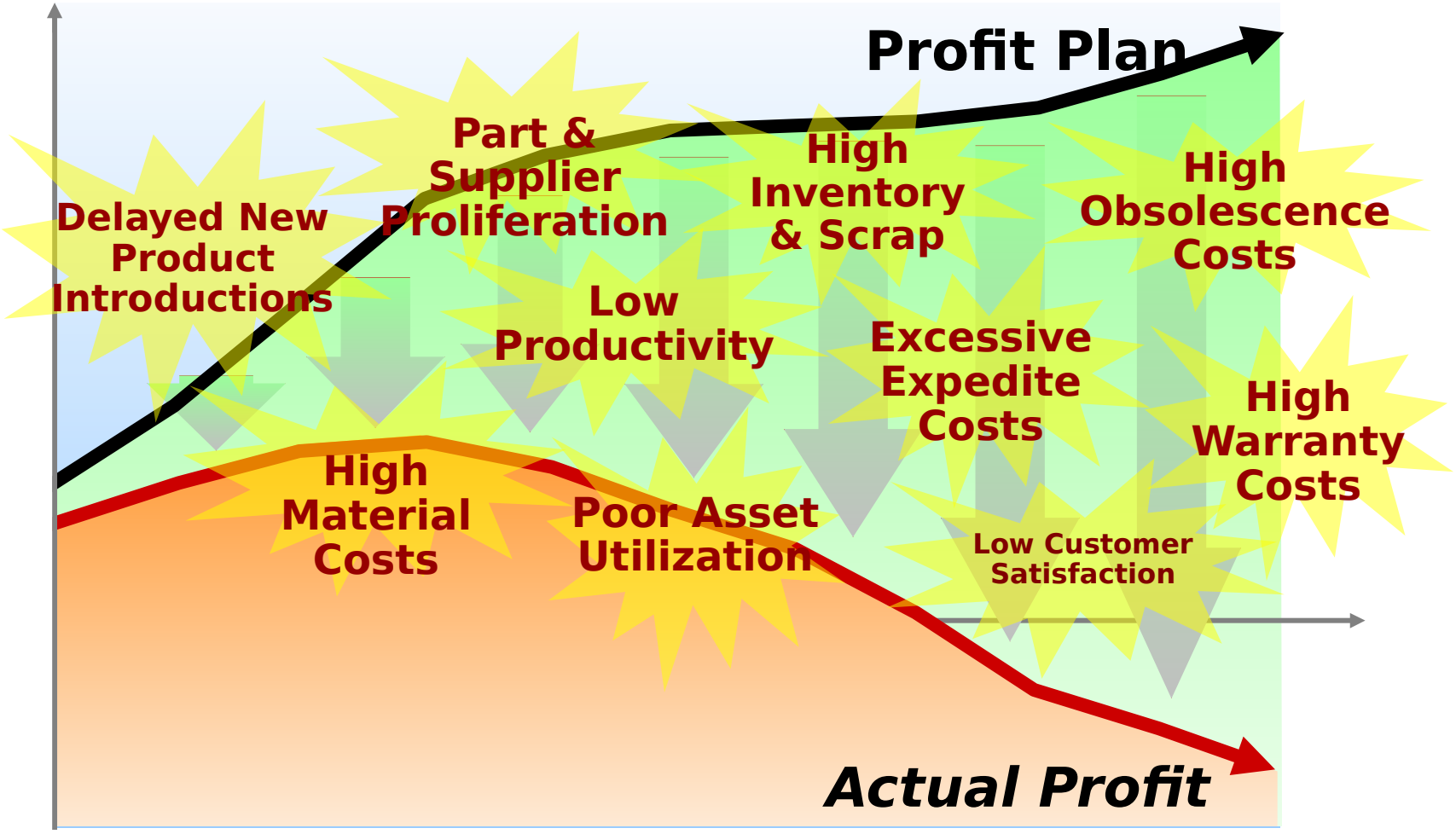
"Parts Management" Challenges


How do I effectively communicate with my supply partners?
Am I leveraging my strategic suppliers?
How do I find new & alternate parts?
Parts Management Challenges
Do our products contain DMSMS or obsolete parts?
Am I using supply chain "friendly" parts in my designs?
Am I getting the DMSMS information I need to plan for obsolescence?
Is the new part I need already used in our other designs?
How do I aggregate spend across multiple divisions?

Poor Parts Management Causes Reduced Profits



Adding the Value of Reference Content

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Content Types - Defined

Structured Data	**Unstructured Data**
Data that fits neatly in a database table	***Need special tools to author & manage***
Authored	
Created and maintained by the organization	
• Internal documents • Bills of Material • Sell-side catalog • PO Numbers • Invoices	• Product Images, Audio & Video • Manuals (User, Installation, etc) • Material Handling & Safety Sheets • Design Documents (Schematics, Assembly Drawings)
Reference	
Used by organization, but obtained from outside the organization	
• Buy-side supplier catalogs • Parametric parts data	• Industry Specs and Standards • Datasheets • EOL Notices

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The Failure of Enterprise Software in Parts Management

- To achieve a global view, companies invested in enterprise software systems - ERP, CRM, PLM, etc - to standardize business processes, best practices, and information across the enterprise
- Despite the significant investment … Why have these systems failed to deliver global supply chain visibility - and the accompanying leverage and cost reductions ?
- Analysis reveals a common thread is a failure to manage and embed “reference” content, used within and among business units
  - “Reference” content that is used, but not defined by the enterprise. Examples include purchased part and supply market information numbers and part lifecycle status

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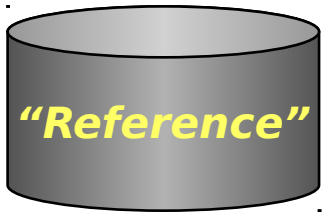
The Result . . .

- While successful at standardizing processes and “authored” content (information defined and maintained internally), problems with “reference” content were never not addressed



Product BOMs
Internal documents
Customer-facing catalogs
Standard costs
Forecasts & schedules
Approved suppliers

Purchased parts specs
Industry standards
Supplier catalogs
Market part cost & availability
Supply market data
Available suppliers & alternates

- ***Cause:*** ***Lack of structure, completeness, accuracy of reference data***
- ***Effect:*** ***Can’t achieve promised efficiencies of enterprise view or leveraged supply network***
- ***Why?***
  - **Difficult to standardize characteristics across suppliers**
  - **Identity can vary depending on position in the supply chain**
  - **Dependencies caused by source & context differences**
  - **Trend increasing complexity & scope of subscribed**

With no means to coalesce “reference” content from disparate sources, “toxic” data was simply copied over to the new system

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Examples of Toxic Content

- Duplicate parts
- Incomplete part descriptions
- Lack of technical detail and standardization
- Invalid or obsolete part records
- Disparate and ‘disconnected’ parts data repositories
- Missing or inadequate supply chain information

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Exponential Risk of Toxic Content

- Increasing number of suppler options
- Increasing number of part choices
- “End of Life” management Challenges
  - Varies by asset type – e.g., consumer electronics vs. automotive vs. aerospace
- Increase in design outsourcing
  - Decreasing control and visibility for organizations
  - Increasing the complexity of sharing the product record vs. years ago
  - Virtual teams and 24X7 design

Creates the requirement to manage both “authored” and “reference” content

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The Impact of Parts Content

- Obsolescence Management
- Convergence of increasing use of commercial parts in long-life assets and products and decreasing product lifecycles has created obsolescence “crisis”, particularly in Defense, Aerospace, and Automotive industries
- Escalating costs of responding to increasing frequency of obsolescence or end-of-life notices for critical parts
- Part selection needs to be lifecycle-aware to avoid high cost of using high-risk, declining parts
- Connecting real-time lifecycle status and lifecycle prediction services with impact analysis tools needed to optimize obsolescence management decisions - with implications measured in the $$$ millions

Parts information is critical to the success of the entire product life-cycle . . . so why is it an after thought?

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Best Practices: Organizing for Content

- **Tactical**
  - Demonstrate value to business managers/users
  - Guidelines for handling content
  - Carrots and sticks
  - LOB must own and IT must support
  - Business regains control
- **Strategic**
  - Standardized tools
  - Critical roles identified
  - Identifying mission-critical content
  - Who is responsible?
  - Define access/how can it be used
  - Standardized taxonomy
  - Point person

Organizations must begin treating mission-critical information/content as a business asset

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Parts Management Benefits

Value Drivers	Value
Increase Revenue - Time to Market • First Mover Advantage – profit leverage • Increased Market Share / Win Rate • Increased Brand Value	**10 – 20x**
Reduce Total Costs • ***Direct Material Costs*** • Spend leverage, Design for Supply Chain • ***Obsolescence Costs*** • Part Shortages, Expedites, Life-time-buys • ***Manufacturing Costs*** • Reduced Downtime, Scrap, Inventory	**10 – 20x**
Avoid Costs - Improved Efficiency • Time Savings – reduced cycle times • Resource Optimization – improved productivity • Right Business Decisions – fewer errors	**5 – 10x**

Practical Real-World Applications

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Government Example

Problem

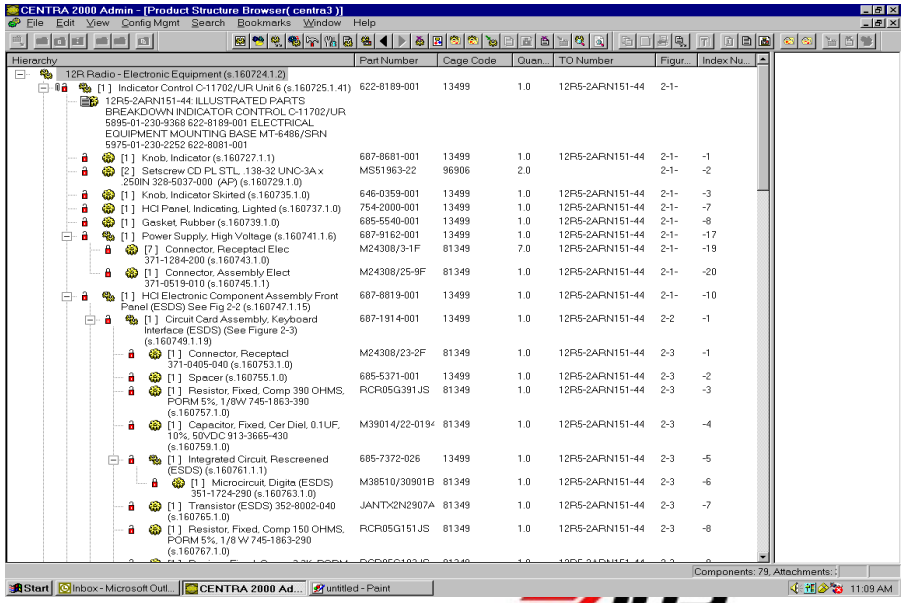
- The Air Force's MRO parts database was incomplete and inaccurate, less than 50% of the complete parts information was resident in the database
- The data format was primarily a flat file and component to assembly relationships could not be easily shown
- No personnel were available to populate and maintain the parts information

Solution

- The accuracy of the parts data in IPBs were found to be estimated to be 70%. IPB were used as a baseline and were double-keyed in order to capture the parts data
- Part number and CAGE code combinations were verified and additional attributes were added by automated processes using IHS databases
- An interface was provided which will allows the support / equipment personnel to inspect, evaluate, modify non-verified parts and make

Results

- Four million parts were captured, processed and successfully loaded into their PDM
- Auto-check processes identified 3,540 potential BOM errors
- Digitized tech data and linked to other sources to assist in the maintenance of the database
- Proven ROI of over 400%



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Government Example

Electronic Parts Obsolescence
A Large and Growing Problem

- Major Drivers for Fielded Systems
  - Costs – Inventory, Redesign
  - Availability
- Primary Causes
  - Commercial Product Life Cycle
  - Shrinking Market Presence
  - Small Quantity Requirements
- Contributing Factors
  - Extended Service Life of Systems
  - Long Development Lead Times
- Root Cause
  - Fragmented markets & information sources

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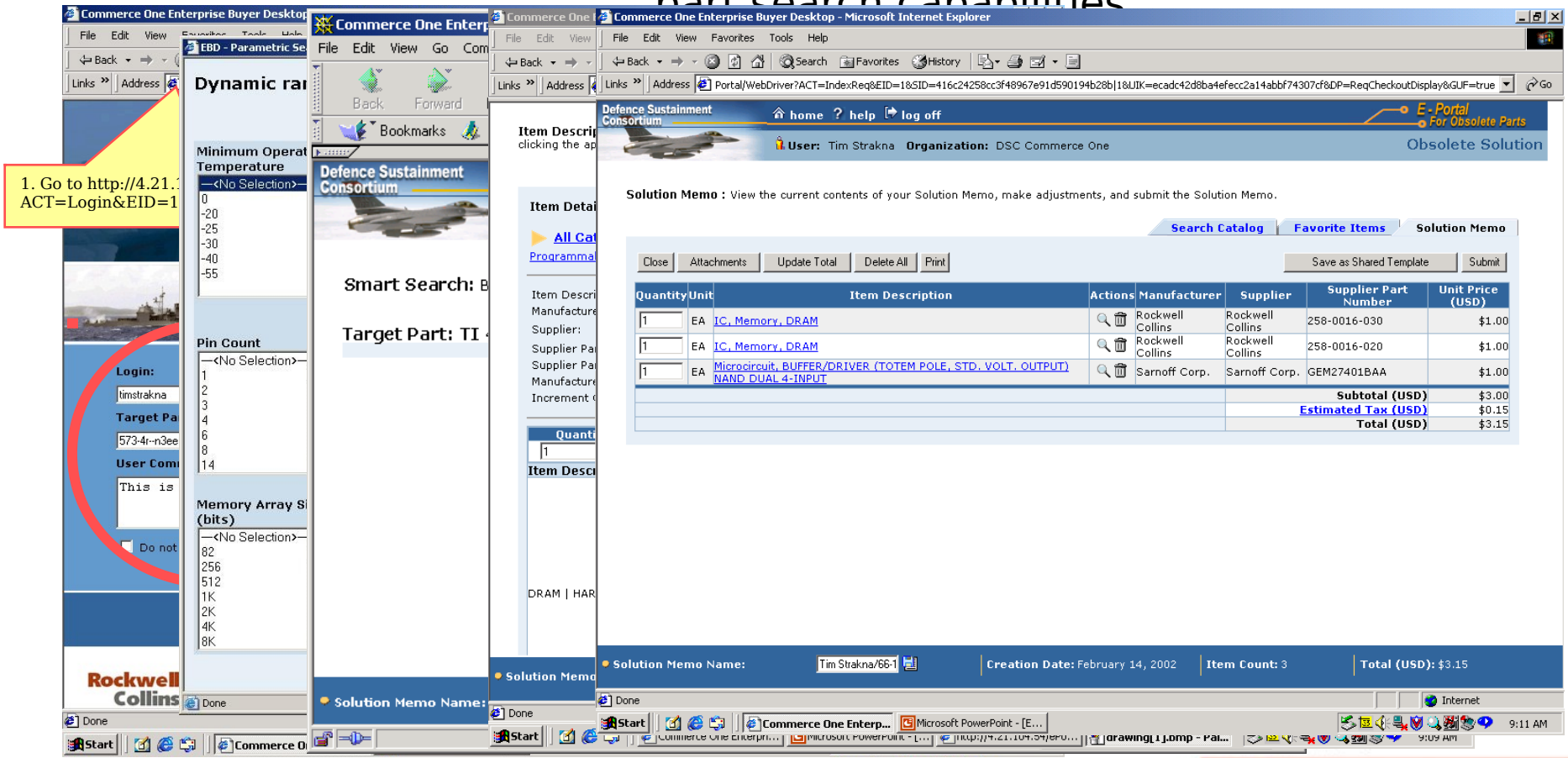
Solution

Demonstrate that an advanced integrated portal tool can reduce costs associated with capturing and sharing Part Obsolescence solutions through more effective and efficient part search capabilities



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Government Example

Problem –

- Internal users need to access and serially search six separate data sources and applications to find solutions.
- Technical Orders, Part Configuration Data, JEDMICS, Haystack, Specs and Standards and CatalogXpress
- External user access limited to only one or at most two data sources.
- No ability to cross reference information contained in different data sources.

Solution

- Portal - Single Entry Point access to six disparate data sources and applications
- TechConnect - Allows for cross reference navigation between applications.

ROI

- Up to 70% reduction in time to access and review data
- Provides larger user group access
- Improved data quantity and quality
- Better decision making

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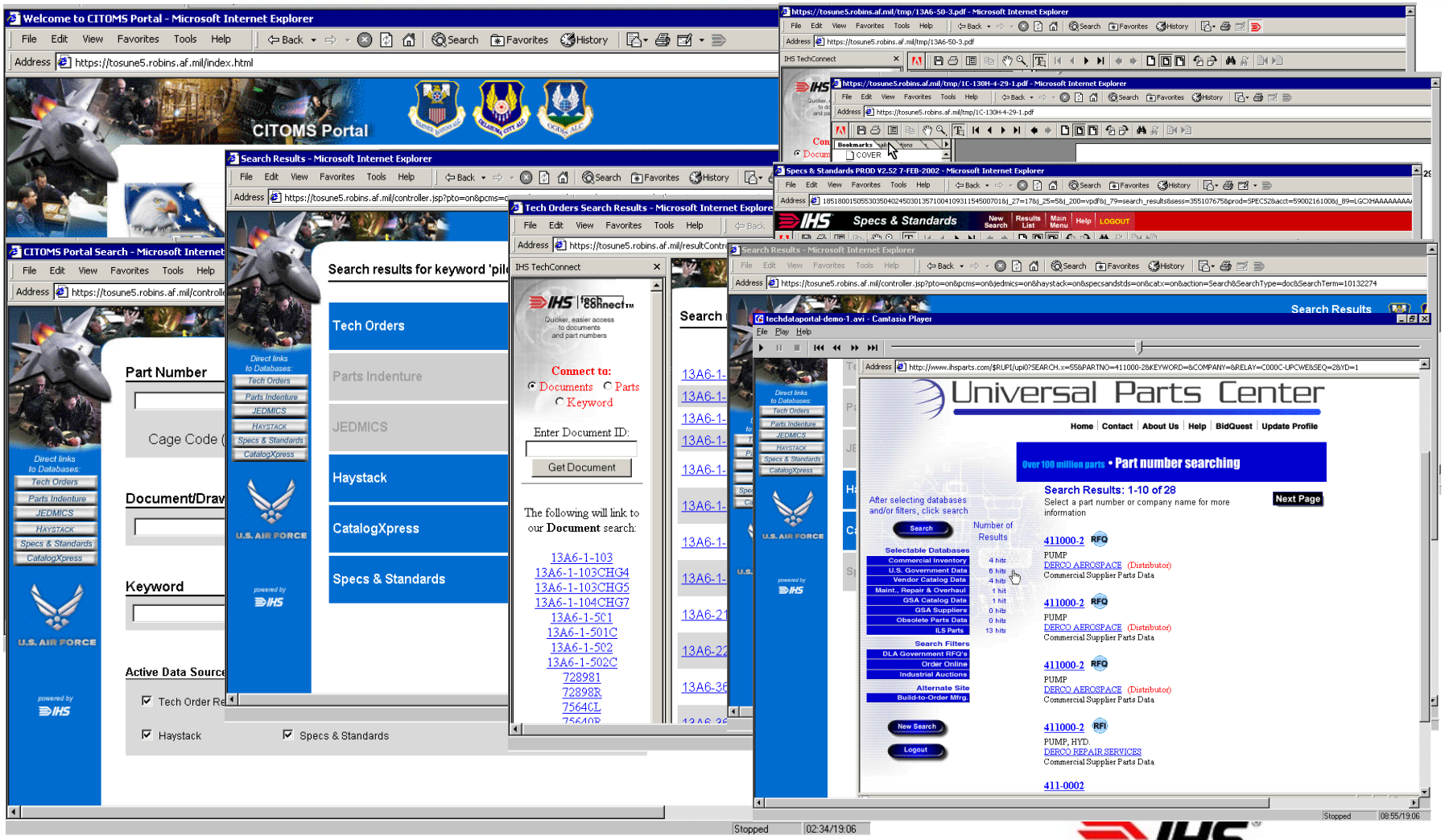
AF TECHNICAL DATA GATEWAY



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IHS Parts Management Solutions

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IHS Parts Management Solutions

IHS Parts Management Solutions enable organizations to increase the effectiveness of their strategic enterprise applications by optimizing the content that fuels them.

What?

- **Provide information and analytics needed to make more profitable component selection, sourcing, and lifecycle management decisions**

How?

- **Connect internal parts to multiple subscription-based and private reference data sources and services**
- **Provide targeted decision support tools to *find*, *standardize*, & *evaluate* commercial, government, and custom parts**

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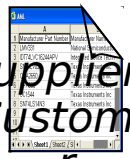
Components of an IHS Solution

Combining reference data, tools, and services improving enterprise processes and business decisions involving parts information

Enterprise Business Processes

ERP PDM EDA EAM



Supplier / Customer

Parts Data

IHS unique solutions combine …

Professional Services

+

Software Applications

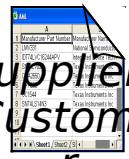
+

Content

Parts Data

Enterprise Business Processes

ERP PDM EDA EAM



Supplier / Customer

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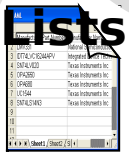
Parts Management Solutions Overview

Enterprise Transacti

ERP
PDM
EDA

EXTRACT

Legacy Parts Lists



Solution Components

Parts Management Decision Support

Parts Data "Cleansing & Enhancement"

IHS Content

IHS Partner Content

Supplier Content

Internal Content

Enterprise Transacti

ERP
PDM
EDA

LOAD

Processed Parts Lists

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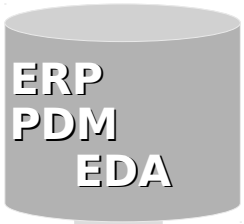
Parts Management Solutions Overview

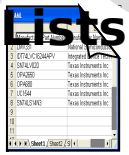
Enterprise Transacti



EXTRACT

"Dirty"

Legacy Parts Lists



Solution Components

Parts Management Decision Support

2. "Solve the Problem"

Parts Data "Cleansing & Enhancement"

1. "Get clean / Keep clean"

IHS Content

IHS Partner Content

Supplier Content

Internal Content

Enterprise Transacti

LOAD

"Cleansed

Processed Parts Lists

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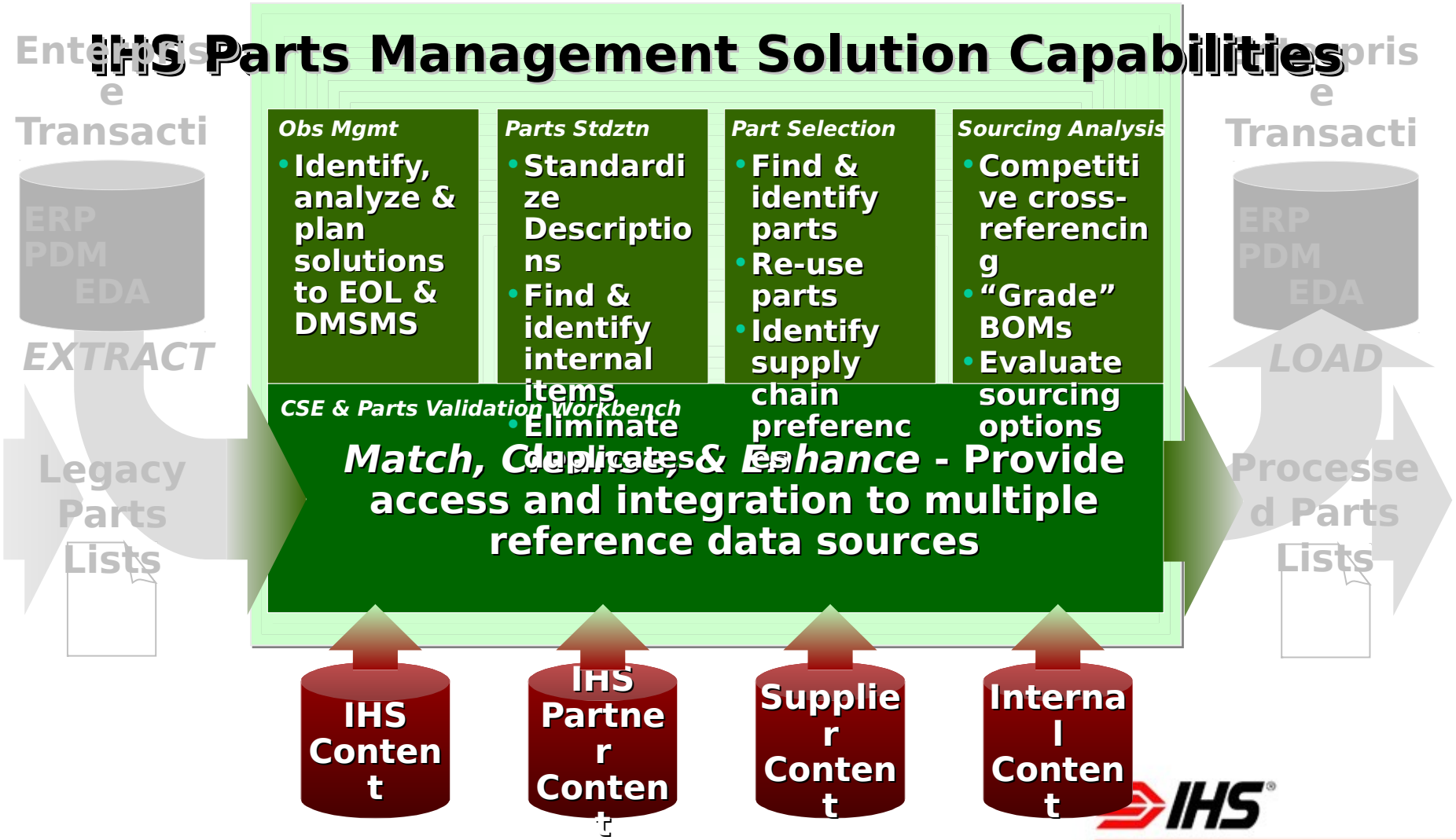
These solutions allow our customers to …

IHS Parts Management Solution Capabilities



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IHS Parts Management -- Offer Set

- **Parts Content & Integration Adapters**
  - CAPS Electronic components database & XML Server
  - HAYSTACK Gov't Parts and Logistics database & integration
- **Cleansing, Standardization & Enhancement**
  - **Direct Parts** - auto & manual matching, 'gap closure', self-serve / full-serve or combination (software & services); cleansing services
  - **Indirect / MRO Parts** - Auto & collaborative matching, classification, description standardization; cleansing services
- **Obsolescence Management**
  - EOL and DMSMS notifications
  - Parts lifecycle health analysis - lifecycle forecasting
  - Obsolescence process management
- **"Intelligent" Parts Selection**
  - Integrated keyword and parametric search
  - Reuse analysis, supply chain preference analysis
- **Sourcing Analysis / Quote Management**
  - Parts cross-referencing for component suppliers
  - RFQ management support for contract manufacturers

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Questions ?

General Discussion

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Thank you

Grant W. Hunter
Director of Product and Solution Management
Office (303) 397-2535

Beth Miller-Herholtz
Director, Business Development Government Markets
Office (540) 347-1736
E-mail bethm@ihs.com

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Glossary

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Glossary of Terms

Aftermarket	"Aftermarket" describes products & suppliers offered for sale after original supplier discontinues production
Alias	Defines equivalent/interchangeable relationships among object instance identifiers. Objects include supplier or part number
AML	Approved Manufacturer List: Interchangeable commercial manufacturer parts that can be used to satisfy demand for an item
ASL	Approved Supplier List: Suppliers approved to supply parts based on commodity
AVL	Approved Vendor List: Vendors approved to receive purchase orders. Includes distributors and other intermediaries.
BOM	Bill of Materials, Item composed of one or more items (components)
CAPS GAP closure	Service to add verified commercial parts from CAPS suppliers to the CAPS database
CRM	Customer Relation Management software
Cross reference	Manufacturer of functionally equivalent part from a difference supplier
CSM	Component Supplier Management software
Direct materials	Material used in the production of discrete products. Within the BOM
DMS	Diminished Manufacturing Sources
DMSMS	Diminished Manufacturing Sources and Material Shortages
Downgrade	Manufacturer part with inferior performance or functionality based on functional attribute such as tolerance
EAM	Enterprise Asset Management software
ECO	Engineering Change Order: Changes to item or BOM resulting in a new item or revision change to an item
EDA	Electronic Design Automation software. Tools used by to design and layout electronic printed circuits and integrated circuits.
EDM	Electronic Document (or Data) Management: software that manages document security and revisions
EMS	Electronics Manufacturing Services provider – turnkey, outsourced manufacturing include purchasing.

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Glossary (cont)

EOL	End-of-Life: An end-of-life part is obsolete.
ERP	Enterprise Resource Planning software: ERP includes MRP plus other integrated business functions such as to financials, inventory, planning, etc.
Facility downtime	Production capacity not utilized
False stock outs	Inventory balance for a part is zero, but duplicate exists in inventory under another name of at another location
Indirect	Materials used to support operations not
Item	Internally defined part
Item Master	Record of all items
Lifetime buy	Single procurement event to obtain parts needed to support production and sustainment for entire life of product
Lifetime buy inventory	Inventory of obsolete parts used for production or sustainment
Linecard	List of suppliers available from a distributor
LTB	Lifetime buy or Last Time Buy
Mapping	Defines equivalent/interchangeable relationship between data fields among systems
Matching	Term used to describe activity involved in determining aliases, also referred to as “cleansing”
MCO	Manufacturing Change Order: Changes to Approved Manufacturer List or Item attributes with no change in revision
MRO	Maintenance & Repair Operations
MRP	Material Resource Planning software. MRP is a system used to determine material requirements to support a production plan
Obsolescence / Obsolete	Obsolete parts are no longer manufacturer by the original supplier
ODM	Outsourced Design Manufacturer provider
PDM	Product Data Management: software that manages product design files and data elements structure, security (sharing), change management processes, and revisions.
PLM	Product Lifecycle Management: PLM includes PDM plus additional integrated business functions such as program or project management, cost management, service and repair tracking

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Glossary (cont)

• PM	• Project Manager: manages professional service resources responsible for delivering solution
• PS	• Professional Services: performs services to implement or deliver solution
• SA	• Solutions Architect: assists in defining value and solution recommendation for customer
• Spot Market Buys	• Purchasing materials from brokers on the open market
• SRM	• Supplier Relationship Management software
• Supplier Aggregation	• Grouping individual suppliers by corporate entity
• Upgrade	• Manufacturer part with superior performance or functionality based on functional attribute such as tolerance
• Validation Workbench	• Tool used to match parts to reference data

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